



# **NUTRIENT MANAGEMENT and WASTE UTILIZATION PLAN SUPPLEMENTAL INFORMATION**

Practice Job Sheet: NC-590/633

(February 2009)

Prepared for: Caledonia Prison Farm

By: Will Mann

Farm: 8920 Tract: 3302-A Date: 4/12/12

## **WHAT IS NUTRIENT MANAGEMENT?**

The conservation practice, Nutrient Management, is managing the amount, source, placement, form and timing of the application of nutrients and soil amendments to achieve realistic production goals, while minimizing nutrient movement to surface or ground waters. The practice, Waste Utilization, is using agricultural waste such as manure or wastewater in an environmentally sound manner. These practices are jointly accomplished through the development of a Nutrient Management/Waste Utilization Plan, which is normally part of a broader Conservation Plan that addresses multiple natural resource concerns on the land. You are encouraged to develop a Comprehensive Nutrient Management Plan (CNMP), which addresses all resource concerns on your animal operation.

## **PURPOSE OF NUTRIENT MANAGEMENT and WASTE UTILIZATION PRACTICES**

Your nutrient management/waste utilization plan is intended to accomplish one or more of the following objectives:

- To budget and supply nutrients for plant production.
- To properly utilize manure or organic by-products as a plant nutrient source.
- To minimize agricultural nonpoint source pollution of surface and ground water resources.

- To maintain or improve the physical, chemical, and biological condition of the soil.
- To utilize agricultural wastes for livestock feed or as an energy source.
- To protect air quality by reducing nitrogen emissions and the formation of atmospheric particulates

## **CONTENTS OF THE NUTRIENT MANAGEMENT / WASTE UTILIZATION PLAN**

The information provided in this Job Sheet and the attachments meet the minimum requirements for a Nutrient Management Plan for USDA-NRCS purposes. This Nutrient Management Plan includes:

1. A plan map and soils map for the area planned (these may be part of the overall Conservation Plan).
2. Location of designated sensitive areas or resources (streams, wells, sinkholes, etc.) and any associated nutrient application setbacks, etc.
3. Your planned crop rotation.
4. Results of soil, plant, water tests.
5. Results from Phosphorus Loss Assessment Tool (PLAT) or Leaching Index (LI) as required.

6. Realistic yield expectations for the crops in the rotation, and their source if other than default values approved for N.C.
7. Recommended nutrient application rates for nitrogen, phosphorus, and potassium, as well as timing, form, and method of application and incorporation, if applicable.
8. This Job Sheet (or comparable information), that provides the following:
  - General requirements of this practice, as well as additional requirements to meet the natural resource protection purposes listed above.
  - Additional considerations specific to this plan.
  - Operation and maintenance information associated with this practice.

Because this Nutrient Management Plan includes agricultural organic sources, additional items are required in the plan to ensure proper waste utilization:

- Waste Utilization Agreement for non-owned or leased land (if applicable)
- Waste Utilization Third Party Agreement (if applicable) (*Note: this will be Exhibit B found in NRCS standard 633 if for conservation planning/CNMP purposes and may additionally include third-party documentation guidance given by the 1217 Interagency Cmte and/or NC Manure Hauler Regs.*)
- Additional engineering design and operating information for waste storage structures, transport, and application system, as applicable. These designs, and the instructions for operating these structures, are an integral component of your overall Nutrient Management/ Waste Utilization Plan.
- Emergency Action Plan to prevent overtopping or other discharges from storage structures or facilities, as applicable.

This plan was developed based on the current NRCS 590 and 633 standards and Federal, state, or local regulations or policies. Changes in laws or regulations may necessitate a revision of the plan.

## BASIC REQUIREMENTS FOR WASTE UTILIZATION

### General

All manure and organic residues must be applied according to a nutrient management plan (see the following section, "BASIC REQUIREMENTS FOR NUTRIENT MANAGEMENT")

You are required to acquire and comply with all federal, state, or local permit requirements related to the handling and application of manure or organic materials.

The nutrient management/waste utilization plan must address all organic waste generated at or brought to the facility. A Waste Utilization Third Party Agreement must exist to address all organic waste not handled by the nutrient management/waste utilization plan. Producers are advised that all agricultural wastes that are applied on land owned or controlled by the producer shall be included in a waste management plan. Signed third-party applicator agreements do not preclude the requirement of a waste management plan for waste applied on land owned or controlled by the producer. Manure haulers must be in compliance with all aspects of Section .1400 of 15A NCAC 02T.

Manure or organic wastes will not be applied to the following areas:

- surface waters,
  - wetlands, unless constructed as a component in a waste treatment system,
  - soils subject to frequent flooding during the period when flooding is expected,
  - frozen, snow-covered, or saturated soils,
  - within 25 feet of perennial waters
  - within 200 feet of a dwelling other than those owned by the producer,
  - within 100 feet of a well,
  - within any other setbacks as identified by federal, state, or local laws or regulations
- Current applicable setbacks for operations defined by Sec. 1300 of 15A NCAC 02T (formerly 2H.0200 thresholds) are available at the NC DSWC Senate Bill 1217 web site:  
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- For operations that hold either State or NPDES permits, application setbacks set forth by that facility's permit must be observed at all times.
- Recent NCSU research indicates that acutely acidic soil conditions contribute to high levels of water solubility of soil P reactive products when organic waste P is applied. Thus, when soil tests show that pH is below soil target pH and lime is recommended, soils should be limed to increase soil pH to soil target levels prior to application of organic waste materials. Target pHs as established by NCDA Agronomic Division are 5.0 for Organic soil class (ORG), 5.5 for Mineral-Organic soil class (M-O), and range from 6.0 to 6.5 for Mineral soil class (MIN) depending on the crop.

Manure or organic wastes will be applied in a manner not to reach surface waters, wetlands (unless constructed as a component in a waste treatment system), property owned by others, or public right-of-way.

Sludge that accumulates in waste storage structures must be analyzed prior to land application. Adequate provisions (available land and/or third party manure agreements) must exist to ensure sludge is applied in adherence to all nutrient application requirements. All federal and state guidance regarding the proper testing, handling, planning, and application of sludge must be followed for regulated operations.

Since compliance with all applicable North Carolina laws is the responsibility of the producer, you should consult the most current version of the 1217 Interagency Guidance Documents for answers to frequently asked questions.

#### **ADDITIONAL REQUIREMENTS FOR PROVIDING LIVESTOCK FEED**

If applicable, all agricultural wastes or other organic residues used for feedstock must be handled in a manner to minimize contamination and preserve its feed value. Chicken litter stored for this purpose must be covered. A qualified animal nutritionist shall

develop rations that utilize animal wastes in supplemental feed.

#### **ADDITIONAL REQUIREMENTS FOR PROVIDING A SOURCE OF ENERGY**

If your facility is to be used for energy production, all energy producing components of the system are included in the Nutrient Management/Waste Utilization Plan and provisions for the utilization of residues of energy production identified. Your Nutrient Management Plan includes the use of these residues, if applicable.

#### **ADDITIONAL REQUIREMENTS FOR PINE FOREST APPLICATION**

When land receiving waste is predominantly pine forest, organic fertilization must be a part of forestry management plan developed by a qualified professional.

Nutrients should not be applied to pine forests that are composed of organic or poorly drained mineral soils. For pine plantations, **do not apply nitrogen during the first five years after planting.** Do not exceed 60 lbs PAN/acre/year on pine forestland, and on long-leaf pine do not exceed 30 lbs PAN/acre/year due to increased disease pressure caused by Nitrogen application. Higher PAN application rates on pine forestland may be approved in situations where concentrated short-term waste applications may be necessary, such as lagoon closures or lagoon sludge management.

**Annual soil tests, taken at a 0"-6" sampling depth, must be completed in pine forest application area to help determine potential for P leaching. If soil test agronomic P indices are above 50, then no additional waste application should occur on forestland.** A phosphorous loss assessment (PLAT) is not needed for forestland receiving waste materials.

Negative impacts to streams, wetlands, and riparian buffers must be avoided when

applying waste materials; and appropriate application setbacks must be observed.

## **BASIC REQUIREMENTS FOR NUTRIENT MANAGEMENT**

### **General**

Application of nutrients must comply with all applicable Federal, state, and local laws and regulations.

The realistic yield expectations (RYEs) in this plan are based on one or more of the following:

- Default values approved by the N.C. Interagency Nutrient Management Committee that incorporate soil productivity information, yield data, and research with North Carolina soils, and cropping systems. Additional information on the default values may be found at: <http://nutrients.soil.ncsu.edu>
- Documented actual yield data from the site, determined by the average of the highest three yields of the last five consecutive specific crop harvests. (For forage crops, determine the average of the highest three years of the last five years.)
- A fertilization rate recommended by North Carolina State University may be used in cases where no yield data or approved RYE values exist for a crop.
- An RYE inferred from a similar crop on a soil with similar physical and chemical features may be used for new crops or in the absence of other RYE data. This inferred RYE may ONLY be specified by a certified Nutrient Management planner.

Erosion, runoff, and water management controls have been planned, as needed, on fields that receive nutrients.

When land receiving waste from a confined animal feeding operation is grazed by

livestock, nutrients from any off-site forage should be accounted for in the nutrient management plan and quantified in approved recordkeeping forms.

### **Soil Testing**

This nutrient management plan has been developed based on current soil test results (no older than three years).

Soil samples must be collected and prepared in accordance with North Carolina State University or the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Agronomic Division standards or recommendations.

Soil test analyses can be performed by any laboratory or program that is certified by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality, Laboratory Section.

NCDA&CS Agronomic Division uses the Mehlich-3 extractant process for soil testing. Growers who utilize other laboratories must request the use of the Mehlich-3 methodology to ensure the test results are compatible with North Carolina's nutrient management planning and assessment tools. For statewide consistency, all laboratories used must provide fertilization recommendations using guidelines and methodologies as referenced at the NCDACS website: [www.ncagr.com/agronomi/obook.htm](http://www.ncagr.com/agronomi/obook.htm)

Growers are encouraged to use a laboratory that is supported by field research within the state.

Soil testing shall include analysis for all nutrients for which specific information is needed to develop the nutrient plan.

### **Plant Tissue Testing**

Tissue sampling and testing, when used, shall be done in accordance with North Carolina State University or NCDA&CS standards or recommendations.

## Manure Testing

Nutrient values of manure and organic by-products shall be established for planning purposes based on laboratory analysis, acceptable default values, or historic records for the operation.

When determining actual application rates, a laboratory analysis is required. State regulations require that waste be tested within 60 days of utilization for some operations. In the case of daily spreading, the waste must be sampled and analyzed at least once a year. Acceptable laboratories include the NCDA&CS Agronomic Division, or others certified by the NCDENR.

## Field Risk Assessment

A field-specific assessment of the potential for phosphorus transport from each field owned, controlled or leased by the producer in the waste management plan (or groups of similar fields) has been conducted, using the North Carolina Phosphorus Loss Assessment Tool (PLAT). Additional Information on PLAT can be found at the NC Nutrient Management website:

<http://nutrients.soil.ncsu.edu/>

PLAT assesses the potential for phosphorus (P) to be transported from the site to surface water through each of the four primary loss pathways:

- sediment-bound P transported through erosion,
- soluble P transported through surface runoff,
- soluble P leached through the soil profile, and
- non-incorporated source P transported through surface runoff.

Based on the assessment of each loss pathway, PLAT produces a single rating for each field. As shown below, this rating will identify whether nitrogen or phosphorus shall be the rate-determining element in developing the planned application rate for manure.

LOW	Nitrogen-based manure application.
MEDIUM	Nitrogen-based manure application.
HIGH	Manure application limited to phosphorus removal from site in harvested plant biomass.
VERY HIGH	No additional manure or starter P application to be specified in plan for the site.

On all sites, regardless of the PLAT rating, starter fertilizers may be recommended in accordance with NCSU guidelines or recommendations. Current NCSU recommendations are that no starter P is to be applied to soils or sites that have Very High PLAT ratings.

In some cases, specific conservation practices that reduce the potential for phosphorus transport have been incorporated into PLAT. Examples include buffers or filter strips, ponds, water table management, and residue management and conservation tillage. Similarly, soil erosion rates, either existing or planned, have been incorporated into your PLAT analysis. This information is shown on the PLAT results enclosed. Because the management of the site actually affects the PLAT rating, all practices identified on the PLAT analysis (including any required to achieve the specified erosion rate) must be either already installed or included in a Conservation Plan for the Nutrient Management Plan to be approved.

Research results have shown that alum or other similar compounds may bind to phosphate in poultry litter, thus making phosphorous less susceptible to losses in runoff where litter is applied. It is important to note that PLAT does not currently recognize treatment of poultry litter with any additive as having a "reducing" effect on P loss. These products have also been shown to reduce ammonia levels in poultry houses.

## Nutrient Application Rates

Recommended nutrient application rates are based on North Carolina State University or NCDA&CS recommendations that consider

PLAT Rating	Nutrient Application Criteria
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current soil test results, RYEs, and management.

Liming material shall be applied as needed to adjust soil pH to the specific range required by the crop or crops in the rotation for optimum availability and utilization of nutrients.

The application amount and rate (in/hr) for liquid wastes (e.g. applied through irrigation) shall not result in runoff from the site. The application shall not exceed the field capacity of the soil. The planned rates of nutrient application are shown on the attached sheets. These rates have been computed as follows:

- **Nitrogen Application** - When the plan is nitrogen-based (a PLAT rating of Low or Medium), the application rate of manure or organic by-products shall be based on the recommended nitrogen rate using the RYE for the site (or a rate recommended by NCSU or NCDA in the case of crops without established RYEs). This may result in an application rate for other nutrients that exceeds the soil test recommendation.
- When the plan is being implemented on a phosphorus standard (a PLAT rating of High or Very High), manure or other organic by-products shall be applied at rates consistent with the phosphorus application guidance below. In such situations, an additional nitrogen application from non-organic sources may be required to supply nitrogen at the rate recommended by the RYE.
- Within the limits allowed by PLAT, manure or other organic by-products may be applied on soybeans at rates equal to the estimated removal of nitrogen in harvested plant biomass.
- All nitrogen rates for hay production are for pure grass stands. Due to the nutrient recycling by grazing animals, the planned nitrogen rate per unit yield for hay crops shall be reduced by 25% for the portion of the expected yield that is removed through grazing.

- **Phosphorus Application** – When manure or other organic by-products are used, the planned rates of phosphorus application shall be based on the PLAT rating for the site, as follows:

Low or Medium Rating – The planned manure or organic by-product application rate is based on the nitrogen needs of the crop.

High Rating – The planned manure or organic by-product application rate is limited to the phosphorus removal rate of the harvested plant biomass.

Very High Rating – No additional manure, organic by-product, or starter P application is specified in the plan.

- On all sites, regardless of the PLAT rating, starter fertilizers containing nitrogen, phosphorus, and potassium may be recommended in accordance with North Carolina State University guidelines or recommendations. Starter fertilizers must be accounted for in the nutrient management plan as part of the nutrient balance for the crop. Current NCSU recommendations are that no starter P is to be applied to soils or sites that have Very High PLAT ratings.

A single application of phosphorus applied as manure or organic by-product may be made at a rate equal to the recommended phosphorus application or estimated phosphorus removal in harvested plant biomass for the crop rotation or multiple years in the crop sequence.

- When such single applications are made, the rate shall:
  - ♦ not exceed the recommended nitrogen application rate during the year of application, or
  - ♦ not exceed the estimated nitrogen removal in harvested plant biomass during the year of application when there is no recommended nitrogen application, or
  - ♦ not be made on sites with a Very High PLAT risk rating.

- **Potassium Application** – Planned potassium application rates should match the soil test recommended rates

<b>ZINC</b>	
<b>Mehlich-3 Index (Zn-I)</b>	<b>Action</b>
300 (21 lbs/ac)	Peanuts are very sensitive to zinc, and application on peanuts should be limited. Seek alternative sites when possible. The risk of zinc toxicity is greater with low soil pH and has been seen at Zn-I as low as 300. *
500 (35 lbs/ac)	Critical toxic level for peanuts. Cease application on peanuts. *
2,000 (142 lbs/ac)	Caution: Seek alternative sites when possible for all crops. *
3,000 (213 lbs/ac)	Critical toxic level for all crops. Cease application for all crops. *
<b>COPPER</b>	
<b>Mehlich-3 Index (Cu-I)</b>	<b>Action</b>
2,000 (72 lbs/ac)	Caution: Seek alternative sites when possible for all crops. *
3,000 (108 lbs/ac)	Critical toxic level for all crops. Cease application on all crops. *
	* Maintain pH at 6.0 on these sites.

as closely as possible. (This is particularly critical in situations where a potentially harmful nutrient imbalance in crops or forages may occur, such as grass tetany). When using manure or other organic sources, the addition of potassium from non-organic sources may be required.

- **Other Plant Nutrients** - The planned rates of application of other nutrients if applicable are consistent with North Carolina State University or the NCDA&CS guidelines or recommendations.

### **Nutrient Application Timing**

Timing of nutrient application shall correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations,

weather and climatic conditions, and field accessibility. Nutrients shall not be applied to frozen, snow-covered, or saturated soil.

Manure or organic by-products shall not be applied more than 30 days prior to planting of the crop or forages breaking dormancy.

For nutrients applied through irrigation systems, application equipment should be properly calibrated to ensure uniform distribution of material at planned rates.

### **Plan Review and Revision Period**

A thorough review and revision (if needed) of the nutrient management plan shall be conducted on a regular cycle, not to exceed five years. State and/or NPDES permitting conditions may require more frequent plan reviews and/or revisions. For NPDES operations, changes to the plan may trigger Permit revision process.

### **Heavy Metals Monitoring**

For animal waste, including sludge, zinc and copper concentrations shall be monitored and alternative crop sites for application shall be sought when these metals approach excessive concentrations. The following criteria and actions are provided:

When sewage sludge is applied, the accumulation of potential pollutants (including arsenic, cadmium, copper, lead, selenium, and zinc) in the soil shall be monitored in accordance with the US Code, Reference 40 CFR, Parts 403 and 503, and applicable state and local laws or regulations. Additional information on heavy metal criteria for sewage sludge may be found in Land Application of Sewage Sludge, EPA/831-B-93-002b publication number at:

<http://www.epa.gov/npdes/pubs/sludge.pdf>

### **ADDITIONAL REQUIREMENTS FOR MINIMIZING DELIVERY OF NUTRIENTS TO SURFACE AND GROUND WATER**

In areas that have been identified as impaired with agricultural nutrients being a likely source, an assessment shall be completed of

the potential for nitrogen or phosphorus transport from the site. (The streams/water bodies in this category are listed in the USDA-NRCS Field Office Technical Guide, Section I, and the list is also available in the NCANAT software.)

## **X NO**

This nutrient management plan **IS NOT** in an area where surface waters are impaired, with agricultural nutrients identified as a likely source. The Leaching Index (LI) is not required.



## **YES**

This nutrient management plan **IS** in an area where surface waters are impaired, with agricultural nutrients identified as a likely source. The Leaching Index (LI) is included in this plan.

While the results of the LI do not affect your planned nutrient application rates, some additional conservation practices may be specified in the plan to reduce the risk of nutrient movement from the field, if applicable.

### **IMPORTANCE OF MANAGING NUTRIENTS**

Nitrogen and phosphorus are water soluble elements and either or both may be a component of organic and inorganic fertilizers. In soluble forms, both can move with water as leachate down through the soil, or over the soil surface as runoff after rainfall. While nitrogen and phosphorus exist in different forms and may move through different transport processes on the same site, they both can have detrimental effects on both surface and shallow ground water quality. As an example, excess nutrients can result in accelerated eutrophication with severe algal blooms and fish kills.

Because of the topography, hydrology, and other factors in the state, the environmental problems from excess nutrients reaching surface water may not be exhibited near the contributing source, but rather create water quality problems far downstream.

Consequently, the Neuse River Basin, Tar-Pamlico Basin, the Chowan River, the watershed of the B. Everett Jordan Reservoir, and the watershed of the New River in Onslow County are listed as Nutrient Sensitive waters in North Carolina.

**Nitrogen:** Nitrogen applied as fertilizer or organic material is transformed into nitrate and can move with the water moving downward into the shallow ground water and eventually to surface waters. (Relatively small amounts of nitrogen reach our surface waters through rainfall runoff. ) The Leaching Index (LI) is a required part of the nutrient management plan in some areas of the state with surface water impairments. The LI uses soils information and local climate data to assess the potential hazard from leaching of nutrients. The results of the LI analysis and recommended actions are included in your nutrient management plan, if applicable.

**Phosphorus:** Research in recent decades indicates that, with high soil phosphorus levels, phosphorus has more potential to be transported off-site than recognized in the past. Phosphorus can be transported in several ways: (1) attached to soil particles leaving the field through erosion, (2) in soluble form leaving the field in surface runoff, and (3) in soluble form leaching downward through the soil profile, and eventually into surface water. Unlike nitrogen, the most likely transport pathway for phosphorus varies by site, and depends upon such factors as soil erosion rate, soil phosphorus levels, texture of soils, existence of buffers, and other factors. In N.C., PLAT is the tool used to assess potential excessive phosphorus losses. The results of the PLAT analysis and recommended actions are included in your nutrient management plan, if applicable.

If a site receives a PLAT rating of Low or Medium, then applying manure at rates based on the nitrogen needs of the crop is allowed. It is important to realize that this may result in phosphorus being applied at rates that significantly exceeds the crop's phosphorus removal rate. In these cases, the planned nutrient application rate is not sustainable, and eventually a PLAT rating of High may be reached.



## OPERATION & MAINTENANCE

You are responsible for safe operation and maintenance of this practice, including all equipment. The following Operation & Maintenance should be conducted:

1. Review the plan annually to determine if adjustments or modifications to the plan are needed. (The S.B. 1217 interagency group guidelines accepted by the N.C. Division of Water Quality for "Sec. 1300" operations specify a plan revision when there are changes in crops or cropping patterns that utilize more than 25 percent of the nitrogen generated by the operation.) For NPDES operations, plan revisions may trigger permitting process that includes public review of NMP/WUP. As a minimum, nutrient management plans shall be thoroughly reviewed every five years and revised if necessary. The next review will be performed in \_\_\_\_\_.
2. Protect fertilizer and organic by-product storage facilities from weather and accidental leakage or spillage.
3. Ensure proper calibration of application equipment to ensure uniform distribution of material at planned rates.
4. Inspect and maintain the equipment and facilities used to implement the Nutrient Management/Waste Utilization Plan regularly. Any needed repairs should be made in a timely manner.
5. Review the Emergency Action Plan, if applicable, annually.
6. Records should be maintained for five years, or for a period as required by other Federal, state, or local ordinances, or program or contract requirements. To ensure adequate information exists to support sound nutrient management, NRCS recommends the following records be included:
  - Soil test results and recommendations for nutrient application,
  - Quantities, analyses and sources of nutrients applied (When the actual rates used exceed the recommended and planned rates on inorganic fertilizer plans, records should indicate the reasons for the differences, e.g. inability to acquire custom blended fertilizer.)
  - Dates and method of nutrient applications,
7. Ensure that workers are protected from and avoid unnecessary contact with inorganic fertilizers and organic by-products. Protection should include the use of protective clothing when working with plant nutrients. Extra caution must be taken when handling ammonia sources of nutrients, or when dealing with organic wastes stored in poorly ventilated enclosures.
8. Properly dispose of material generated by the cleaning of nutrient application equipment. Excess material should be collected and stored or field applied in an appropriate manner. Excess material should not be applied on areas of high potential risk for runoff or leaching.
  - Properly dispose of or recycle nutrient containers according to state and local guidelines or regulations.
  - Crops planted, planting and harvest dates, yields, and crop residues removed,
  - Results of water, plant, and organic by-product analyses, and
  - Dates of review and person performing the review, and recommendations that resulted from the review.

NOTE: State and federal permitting requirements or regulations may define record-keeping requirements for some operations.



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## **SUPPLEMENTAL INFORMATION**

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(February 2009)

Prepared for: Caledonia Prison Farm

By: Will Mann

Farm: 8920 Tract: 3304-B Date: 4/12/12

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Since compliance with all applicable North Carolina laws is the responsibility of the producer, you should consult the most current version of the 1217 Interagency Guidance Documents for answers to frequently asked questions.

#### **ADDITIONAL REQUIREMENTS FOR PROVIDING LIVESTOCK FEED**

If applicable, all agricultural wastes or other organic residues used for feedstock must be handled in a manner to minimize contamination and preserve its feed value. Chicken litter stored for this purpose must be covered. A qualified animal nutritionist shall

develop rations that utilize animal wastes in supplemental feed.

#### **ADDITIONAL REQUIREMENTS FOR PROVIDING A SOURCE OF ENERGY**

If your facility is to be used for energy production, all energy producing components of the system are included in the Nutrient Management/Waste Utilization Plan and provisions for the utilization of residues of energy production identified. Your Nutrient Management Plan includes the use of these residues, if applicable.

#### **ADDITIONAL REQUIREMENTS FOR PINE FOREST APPLICATION**

When land receiving waste is predominantly pine forest, organic fertilization must be a part of forestry management plan developed by a qualified professional.

Nutrients should not be applied to pine forests that are composed of organic or poorly drained mineral soils. For pine plantations, **do not apply nitrogen during the first five years after planting.** Do not exceed 60 lbs PAN/acre/year on pine forestland, and on long-leaf pine do not exceed 30 lbs PAN/acre/year due to increased disease pressure caused by Nitrogen application. Higher PAN application rates on pine forestland may be approved in situations where concentrated short-term waste applications may be necessary, such as lagoon closures or lagoon sludge management.

**Annual soil tests, taken at a 0"-6" sampling depth, must be completed in pine forest application area to help determine potential for P leaching. If soil test agronomic P indices are above 50, then no additional waste application should occur on forestland.** A phosphorous loss assessment (PLAT) is not needed for forestland receiving waste materials.

Negative impacts to streams, wetlands, and riparian buffers must be avoided when

applying waste materials, and appropriate application setbacks must be observed.

## **BASIC REQUIREMENTS FOR NUTRIENT MANAGEMENT**

### **General**

Application of nutrients must comply with all applicable Federal, state, and local laws and regulations.

The realistic yield expectations (RYEs) in this plan are based on one or more of the following:

- Default values approved by the N.C. Interagency Nutrient Management Committee that incorporate soil productivity information, yield data, and research with North Carolina soils, and cropping systems. Additional information on the default values may be found at: <http://nutrients.soil.ncsu.edu>
- Documented actual yield data from the site, determined by the average of the highest three yields of the last five consecutive specific crop harvests. (For forage crops, determine the average of the highest three years of the last five years.)
- A fertilization rate recommended by North Carolina State University may be used in cases where no yield data or approved RYE values exist for a crop.
- An RYE inferred from a similar crop on a soil with similar physical and chemical features may be used for new crops or in the absence of other RYE data. This inferred RYE may ONLY be specified by a certified Nutrient Management planner.

Erosion, runoff, and water management controls have been planned, as needed, on fields that receive nutrients.

When land receiving waste from a confined animal feeding operation is grazed by

livestock, nutrients from any off-site forage should be accounted for in the nutrient management plan and quantified in approved recordkeeping forms.

### **Soil Testing**

This nutrient management plan has been developed based on current soil test results (no older than three years).

Soil samples must be collected and prepared in accordance with North Carolina State University or the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Agronomic Division standards or recommendations.

Soil test analyses can be performed by any laboratory or program that is certified by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality, Laboratory Section.

NCDA&CS Agronomic Division uses the Mehlich-3 extractant process for soil testing. Growers who utilize other laboratories must request the use of the Mehlich-3 methodology to ensure the test results are compatible with North Carolina's nutrient management planning and assessment tools. For statewide consistency, all laboratories used must provide fertilization recommendations using guidelines and methodologies as referenced at the NCDACS website:

[www.ncagr.com/agronomi/obook.htm](http://www.ncagr.com/agronomi/obook.htm)

Growers are encouraged to use a laboratory that is supported by field research within the state.

Soil testing shall include analysis for all nutrients for which specific information is needed to develop the nutrient plan.

### **Plant Tissue Testing**

Tissue sampling and testing, when used, shall be done in accordance with North Carolina State University or NCDA&CS standards or recommendations.

## Manure Testing

Nutrient values of manure and organic by-products shall be established for planning purposes based on laboratory analysis, acceptable default values, or historic records for the operation.

When determining actual application rates, a laboratory analysis is required. State regulations require that waste be tested within 60 days of utilization for some operations. In the case of daily spreading, the waste must be sampled and analyzed at least once a year. Acceptable laboratories include the NCDA&CS Agronomic Division, or others certified by the NCDENR.

## Field Risk Assessment

A field-specific assessment of the potential for phosphorus transport from each field owned, controlled or leased by the producer in the waste management plan (or groups of similar fields) has been conducted, using the North Carolina Phosphorus Loss Assessment Tool (PLAT). Additional Information on PLAT can be found at the NC Nutrient Management website:

<http://nutrients.soil.ncsu.edu/>

PLAT assesses the potential for phosphorus (P) to be transported from the site to surface water through each of the four primary loss pathways:

- sediment-bound P transported through erosion,
- soluble P transported through surface runoff,
- soluble P leached through the soil profile, and
- non-incorporated source P transported through surface runoff.

Based on the assessment of each loss pathway, PLAT produces a single rating for each field. As shown below, this rating will identify whether nitrogen or phosphorus shall be the rate-determining element in developing the planned application rate for manure.

LOW	Nitrogen-based manure application.
MEDIUM	Nitrogen-based manure application.
HIGH	Manure application limited to phosphorus removal from site in harvested plant biomass.
VERY HIGH	No additional manure or starter P application to be specified in plan for the site.

On all sites, regardless of the PLAT rating, starter fertilizers may be recommended in accordance with NCSU guidelines or recommendations. Current NCSU recommendations are that no starter P is to be applied to soils or sites that have Very High PLAT ratings.

In some cases, specific conservation practices that reduce the potential for phosphorus transport have been incorporated into PLAT. Examples include buffers or filter strips, ponds, water table management, and residue management and conservation tillage. Similarly, soil erosion rates, either existing or planned, have been incorporated into your PLAT analysis. This information is shown on the PLAT results enclosed. Because the management of the site actually affects the PLAT rating, all practices identified on the PLAT analysis (including any required to achieve the specified erosion rate) must be either already installed or included in a Conservation Plan for the Nutrient Management Plan to be approved.

Research results have shown that alum or other similar compounds may bind to phosphate in poultry litter, thus making phosphorous less susceptible to losses in runoff where litter is applied. It is important to note that PLAT does not currently recognize treatment of poultry litter with any additive as having a "reducing" effect on P loss. These products have also been shown to reduce ammonia levels in poultry houses.

## Nutrient Application Rates

Recommended nutrient application rates are based on North Carolina State University or NCDA&CS recommendations that consider

PLAT Rating	Nutrient Application Criteria
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current soil test results, RYEs, and management.

Liming material shall be applied as needed to adjust soil pH to the specific range required by the crop or crops in the rotation for optimum availability and utilization of nutrients.

The application amount and rate (in/hr) for liquid wastes (e.g. applied through irrigation) shall not result in runoff from the site. The application shall not exceed the field capacity of the soil. The planned rates of nutrient application are shown on the attached sheets. These rates have been computed as follows:

- **Nitrogen Application** - When the plan is nitrogen-based (a PLAT rating of Low or Medium), the application rate of manure or organic by-products shall be based on the recommended nitrogen rate using the RYE for the site (or a rate recommended by NCSU or NCDA in the case of crops without established RYEs). This may result in an application rate for other nutrients that exceeds the soil test recommendation.
- When the plan is being implemented on a phosphorus standard (a PLAT rating of High or Very High), manure or other organic by-products shall be applied at rates consistent with the phosphorus application guidance below. In such situations, an additional nitrogen application from non-organic sources may be required to supply nitrogen at the rate recommended by the RYE.
- Within the limits allowed by PLAT, manure or other organic by-products may be applied on soybeans at rates equal to the estimated removal of nitrogen in harvested plant biomass.
- All nitrogen rates for hay production are for pure grass stands. Due to the nutrient recycling by grazing animals, the planned nitrogen rate per unit yield for hay crops shall be reduced by 25% for the portion of the expected yield that is removed through grazing.

- **Phosphorus Application** – When manure or other organic by-products are used, the planned rates of phosphorus application shall be based on the PLAT rating for the site, as follows:

Low or Medium Rating – The planned manure or organic by-product application rate is based on the nitrogen needs of the crop.

High Rating – The planned manure or organic by-product application rate is limited to the phosphorus removal rate of the harvested plant biomass.

Very High Rating – No additional manure, organic by-product, or starter P application is specified in the plan.

- On all sites, regardless of the PLAT rating, starter fertilizers containing nitrogen, phosphorus, and potassium may be recommended in accordance with North Carolina State University guidelines or recommendations. Starter fertilizers must be accounted for in the nutrient management plan as part of the nutrient balance for the crop. Current NCSU recommendations are that no starter P is to be applied to soils or sites that have Very High PLAT ratings.

A single application of phosphorus applied as manure or organic by-product may be made at a rate equal to the recommended phosphorus application or estimated phosphorus removal in harvested plant biomass for the crop rotation or multiple years in the crop sequence.

- When such single applications are made, the rate shall:
  - ♦ not exceed the recommended nitrogen application rate during the year of application, or
  - ♦ not exceed the estimated nitrogen removal in harvested plant biomass during the year of application when there is no recommended nitrogen application, or
  - ♦ not be made on sites with a Very High PLAT risk rating.

- **Potassium Application** – Planned potassium application rates should match the soil test recommended rates

<b>ZINC</b>	
<b>Mehlich-3 Index (Zn-I)</b>	<b>Action</b>
300 (21 lbs/ac)	Peanuts are very sensitive to zinc, and application on peanuts should be limited. Seek alternative sites when possible. The risk of zinc toxicity is greater with low soil pH and has been seen at Zn-I as low as 300. *
500 (35 lbs/ac)	Critical toxic level for peanuts. Cease application on peanuts. *
2,000 (142 lbs/ac)	Caution: Seek alternative sites when possible for all crops. *
3,000 (213 lbs/ac)	Critical toxic level for all crops. Cease application for all crops. *
<b>COPPER</b>	
<b>Mehlich-3 Index (Cu-I)</b>	<b>Action</b>
2,000 (72 lbs/ac)	Caution: Seek alternative sites when possible for all crops. *
3,000 (108 lbs/ac)	Critical toxic level for all crops. Cease application on all crops. *
	* Maintain pH at 6.0 on these sites.

as closely as possible. (This is particularly critical in situations where a potentially harmful nutrient imbalance in crops or forages may occur, such as grass tetany). When using manure or other organic sources, the addition of potassium from non-organic sources may be required.

- **Other Plant Nutrients** - The planned rates of application of other nutrients if applicable are consistent with North Carolina State University or the NCDA&CS guidelines or recommendations.

### Nutrient Application Timing

Timing of nutrient application shall correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations,

weather and climatic conditions, and field accessibility. Nutrients shall not be applied to frozen, snow-covered, or saturated soil.

Manure or organic by-products shall not be applied more than 30 days prior to planting of the crop or forages breaking dormancy.

For nutrients applied through irrigation systems, application equipment should be properly calibrated to ensure uniform distribution of material at planned rates.

### Plan Review and Revision Period

A thorough review and revision (if needed) of the nutrient management plan shall be conducted on a regular cycle, not to exceed five years. State and/or NPDES permitting conditions may require more frequent plan reviews and/or revisions. For NPDES operations, changes to the plan may trigger Permit revision process.

### Heavy Metals Monitoring

For animal waste, including sludge, zinc and copper concentrations shall be monitored and alternative crop sites for application shall be sought when these metals approach excessive concentrations. The following criteria and actions are provided:

When sewage sludge is applied, the accumulation of potential pollutants (including arsenic, cadmium, copper, lead, selenium, and zinc) in the soil shall be monitored in accordance with the US Code, Reference 40 CFR, Parts 403 and 503, and applicable state and local laws or regulations. Additional information on heavy metal criteria for sewage sludge may be found in Land Application of Sewage Sludge, EPA/831-B-93-002b publication number at:

<http://www.epa.gov/npdes/pubs/sludge.pdf>

### ADDITIONAL REQUIREMENTS FOR MINIMIZING DELIVERY OF NUTRIENTS TO SURFACE AND GROUND WATER

In areas that have been identified as impaired with agricultural nutrients being a likely source, an assessment shall be completed of



the potential for nitrogen or phosphorus transport from the site. (The streams/water bodies in this category are listed in the USDA-NRCS Field Office Technical Guide, Section I, and the list is also available in the NCANAT software.)

## **X NO**

This nutrient management plan **IS NOT** in an area where surface waters are impaired, with agricultural nutrients identified as a likely source. The Leaching Index (LI) is not required.

## ☐ YES

This nutrient management plan **IS** in an area where surface waters are impaired, with agricultural nutrients identified as a likely source. The Leaching Index (LI) is included in this plan.

While the results of the LI do not affect your planned nutrient application rates, some additional conservation practices may be specified in the plan to reduce the risk of nutrient movement from the field, if applicable.

### **IMPORTANCE OF MANAGING NUTRIENTS**

Nitrogen and phosphorus are water soluble elements and either or both may be a component of organic and inorganic fertilizers. In soluble forms, both can move with water as leachate down through the soil, or over the soil surface as runoff after rainfall. While nitrogen and phosphorus exist in different forms and may move through different transport processes on the same site, they both can have detrimental effects on both surface and shallow ground water quality. As an example, excess nutrients can result in accelerated eutrophication with severe algal blooms and fish kills.

Because of the topography, hydrology, and other factors in the state, the environmental problems from excess nutrients reaching surface water may not be exhibited near the contributing source, but rather create water quality problems far downstream.

Consequently, the Neuse River Basin, Tar-Pamlico Basin, the Chowan River, the watershed of the B. Everett Jordan Reservoir, and the watershed of the New River in Onslow County are listed as Nutrient Sensitive waters in North Carolina.

**Nitrogen:** Nitrogen applied as fertilizer or organic material is transformed into nitrate and can move with the water moving downward into the shallow ground water and eventually to surface waters. (Relatively small amounts of nitrogen reach our surface waters through rainfall runoff.) The Leaching Index (LI) is a required part of the nutrient management plan in some areas of the state with surface water impairments. The LI uses soils information and local climate data to assess the potential hazard from leaching of nutrients. The results of the LI analysis and recommended actions are included in your nutrient management plan, if applicable.

**Phosphorus:** Research in recent decades indicates that, with high soil phosphorus levels, phosphorus has more potential to be transported off-site than recognized in the past. Phosphorus can be transported in several ways: (1) attached to soil particles leaving the field through erosion, (2) in soluble form leaving the field in surface runoff, and (3) in soluble form leaching downward through the soil profile, and eventually into surface water. Unlike nitrogen, the most likely transport pathway for phosphorus varies by site, and depends upon such factors as soil erosion rate, soil phosphorus levels, texture of soils, existence of buffers, and other factors. In N.C., PLAT is the tool used to assess potential excessive phosphorus losses. The results of the PLAT analysis and recommended actions are included in your nutrient management plan, if applicable.

If a site receives a PLAT rating of Low or Medium, then applying manure at rates based on the nitrogen needs of the crop is allowed. It is important to realize that this may result in phosphorus being applied at rates that significantly exceeds the crop's phosphorus removal rate. In these cases, the planned nutrient application rate is not sustainable, and eventually a PLAT rating of High may be reached.

## OPERATION & MAINTENANCE

You are responsible for safe operation and maintenance of this practice, including all equipment. The following Operation & Maintenance should be conducted:

1. Review the plan annually to determine if adjustments or modifications to the plan are needed. (The S.B. 1217 interagency group guidelines accepted by the N.C. Division of Water Quality for "Sec .1300" operations specify a plan revision when there are changes in crops or cropping patterns that utilize more than 25 percent of the nitrogen generated by the operation.) For NPDES operations, plan revisions may trigger permitting process that includes public review of NMP/WUP. As a minimum, nutrient management plans shall be thoroughly reviewed every five years and revised if necessary. The next review will be performed in \_\_\_\_\_.
2. Protect fertilizer and organic by-product storage facilities from weather and accidental leakage or spillage.
3. Ensure proper calibration of application equipment to ensure uniform distribution of material at planned rates.
4. Inspect and maintain the equipment and facilities used to implement the Nutrient Management/Waste Utilization Plan regularly. Any needed repairs should be made in a timely manner.
5. Review the Emergency Action Plan, if applicable, annually.
6. Records should be maintained for five years, or for a period as required by other Federal, state, or local ordinances, or program or contract requirements. To ensure adequate information exists to support sound nutrient management, NRCS recommends the following records be included:
  - Soil test results and recommendations for nutrient application,
  - Quantities, analyses and sources of nutrients applied (When the actual rates used exceed the recommended and planned rates on inorganic fertilizer plans, records should indicate the reasons for the differences, e.g. inability to acquire custom blended fertilizer.)
  - Dates and method of nutrient applications,
7. Ensure that workers are protected from and avoid unnecessary contact with inorganic fertilizers and organic by-products. Protection should include the use of protective clothing when working with plant nutrients. Extra caution must be taken when handling ammonia sources of nutrients, or when dealing with organic wastes stored in poorly ventilated enclosures.
8. Properly dispose of material generated by the cleaning of nutrient application equipment. Excess material should be collected and stored or field applied in an appropriate manner. Excess material should not be applied on areas of high potential risk for runoff or leaching.
  - Properly dispose of or recycle nutrient containers according to state and local guidelines or regulations.
  - Crops planted, planting and harvest dates, yields, and crop residues removed,
  - Results of water, plant, and organic by-product analyses, and
  - Dates of review and person performing the review, and recommendations that resulted from the review.

NOTE: State and federal permitting requirements or regulations may define record-keeping requirements for some operations.



# Waste Analysis Report

**Grower:** Caledonia Farms  
PO Box 67  
Tillery, NC 27887  
*Farm:* \$920

Farm: 8920

Received:	01/19/2012	Completed:	02/24/2012	<a href="#">Links to Helpful Information</a>	Halifax County
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### **Links to Helpful Information**

Completed: 02/24/2012

Sample Information		Laboratory Results (parts per million unless otherwise noted)																		
Sample ID: 01  Waste Code: ASP  Description: Poultry Lagoon Sludge  Recommendations: Application Method Soil Incorporation	N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	C						
	Total	10843	3472	1077	13834	1414	997	1008	244	243	67.3	5.64								
	IN-N																			
	-NH4																			
	-NO3																			
OR-N		Na	Ni	Cd	Pb	Al	Se	Li	pH	SS	C:N	DM%	CCIE%	ALE(kgal)						
		294							7.24											
	Nutrients Available for First Crop																			
	lbs/1000 gallons										Other Elements						lbs/1000 gallons			
	N	P2O5	K2O	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	Na	Ni	Cd	Pb	Al	Se	Li
	54.3	53.1	9.7	92.3	9.4	6.7	6.7	1.6	1.6	0.45	0.04			2.5						

Completed: Jan. 27, 2012

Nitrogen, phosphorus, zinc, and copper concentrations are very high in this sample. The material can be applied at rates needed to meet crop nitrogen requirement unless one of the other elements are more restrictive. When soil test P is very high and the site is vulnerable to phosphorus movement to nearby surface water, limit application of P to estimated crop removal of this element. Limit applications of zinc and copper as necessary to avoid excess accumulation of these elements in the soil.

Sample Information		Laboratory Results (parts per million unless otherwise noted)																			
Sample ID:	N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	C							
02	264	101	714	173	56.9	38.2	6.49	1.49	2.19	0.74	0.78										
Waste Code:	-NH4																				
LSP	-NO3																				
Description:	OR-N	Na	Ni	Cd	Pb	Al	Se	Li	pH	SS	C:N	DM%	GCE%	ALE(Ngal)							
Poultry Liq. Slurry	Urea	163							7.22												
Recommendations:	Nutrients Available for First Crop																Other Elements				
	Ibs/1000 gallons																Ibs/1000 gallons				
	N	P2O5	K2O	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	Na	Ni	Pb	Cd	Se	Li		
0.73	1.4	5.7	1.0	0.33	0.22	0.04	0.01	0.01	0.01	T	T	T		1.4							
Application Method																					
Irrigation																					



# RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3302-A	36

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StB State fine sandy loam, 2 to 6 percent slopes\State fine sandy loam 80%	5.0	450	3.0

## Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation-induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/ac
	CMZ 671a.Single Year/Single Crop Templates\Hay\Tall fescue grass; harvested for hay, high yield, CMZ67	default	(none)	(none)	0.12	1.2	0.42	0	6.77	939000	20.30

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3302-A	40

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	Sta State fine sandy loam, 0 to 2 percent slopes\State fine sandy loam 95%	5.0	600	2.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation- induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/t
	CMZ 67/a. Single Year/Single Crop Templates\Soybeans\Soybeans; spring disk, 45 BU, CMZ67	default	(none)	(none)	6.9	-0.48	86	0	4.79	664000	14.3
	CMZ 67/a. Single Year/Single Crop Templates\Soybeans\Soybeans; strip till into winter weed residue, 45 BU, CMZ67	default	(none)	(none)	1.6	0.30	6.2	0	3.38	469000	10.1

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3302-A	41

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	Sta State fine sandy loam, 0 to 2 percent slopes\State fine sandy loam 95%	5.0	600	2.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation-induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/t
	CMZ 671a.Single Year/Single Crop Templates\Soybeans\Soybeans; spring disk, 45 BU, CMZ67	default	(none)	(none)	7.4	-0.52	86	0	4.79	664000	14.36
	CMZ 671a.Single Year/Single Crop Templates\Soybeans\Soybeans; strip till into winter weed residue, 45 BU, CMZ67	default	(none)	(none)	1.7	0.29	6.2	0	3.38	469000	10.16

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3302-A	46

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StB State fine sandy loam, 2 to 6 percent slopes\State fine sandy loam 80%	5.0	600	4.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation- induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/ac
	CMZ 67\A.Single Year\Single Crop Templates\Hay\Tail fescue grass; harvested for hay, high yield, CMZ67	default	(none)	(none)	0.15	1.2	0.42	0	6.77	939000	20.30

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.



## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3302-A	47

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StB State fine sandy loam, 2 to 6 percent slopes\State fine sandy loam 80%	5.0	600	3.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation-induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/ac
	CMZ 671a Single Year/Single Crop Templates\Hay\Tall fescue grass; harvested for hay, high yield, CMZ67	default	(none)	(none)	0.12	1.2	0.42	0	6.77	939000	20.30

The SCI is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3302-A	48

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StB State fine sandy loam, 2 to 6 percent slopes\State fine sandy loam 80%	5.0	300	3.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation- induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/ac
	CMZ 67a.Single Year/Single Crop Templates/Hay/Tall fescue grass; harvested for hay, high yield, CMZ67	default	(none)	(none)	0.12	1.2	0.42	0	6.77	939000	20.30

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3304-B	147

Location	Soil	T value, t/acyr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StB State fine sandy loam, 2 to 6 percent slopes\State fine sandy loam 80%	5.0	600	3.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan, soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation-induced erosion for SCI, t/acyr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/t
	CMZ 671a.Single Year/Single Crop Templates\Soybeans\Soybeans; spring disk, 45 BU, CMZ67	default	(none)	(none)	16	-1.2	86	0	4.79	664000	14.3t
	CMZ 671a.Single Year/Single Crop Templates\Soybeans\Soybeans; strip till into winter weed residue, 45 BU, CMZ67	default	(none)	(none)	3.4	0.16	6.2	0	3.38	469000	10.1t

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3304-B	164

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StB State fine sandy loam, 2 to 6 percent slopes\State fine sandy loam 80%	5.0	450	4.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation-induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/ac
	CMZ 67a.Single Year/Single Crop Templates\Hay\Tall fescue grass; harvested for hay, high yield, CMZ67	default	(none)	(none)	0.15	1.2	0.42	0	6.77	939000	20.30

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3304-B	172

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StB State fine sandy loam, 2 to 6 percent slopes\State fine sandy loam 80%	5.0	250	3.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation-induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/ac
	CMZ 67a.Single Year/Single Crop Templates\Hay\Tall fescue grass; harvested for hay, high yield, CMZ67	default	(none)	(none)	0.11	1.2	0.42	0	6.77	939000	20.30

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3304-B	189

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StB State fine sandy loam, 2 to 6 percent slopes\State fine sandy loam 80%	5.0	750	3.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation- induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/t
CMZ 67a.Single Year/Single Crop Templates\Soybeans\Soybeans; spring disk, 45 BU, CMZ67		default	(none)	(none)	11	-0.83	86	0	4.79	664000	14.3t
CMZ 67a.Single Year/Single Crop Templates\Soybeans\Soybeans; strip till into winter weed residue, 45 BU, CMZ67		default	(none)	(none)	2.5	0.23	6.2	0	3.38	469000	10.1t

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

# RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3304-B	190

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StA State fine sandy loam, 0 to 2 percent slopes\State fine sandy loam 95%	5.0	500	2.0

## Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation-induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/ac
	CMZ 67a.Single Year/Single Crop Templates\Soybeans\Soybeans; spring disk, 45 BU, CMZ67	default	(none)	(none)	6.9	-0.48	86	0	4.79	664000	14.3
	CMZ 67a.Single Year/Single Crop Templates\Soybeans\Soybeans; strip till into winter weed residue, 45 BU, CMZ67	default	(none)	(none)	1.6	0.30	6.2	0	3.38	469000	10.1

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

## RUSLE2 Worksheet Erosion Calculation Record

Info: Waste Utilization Plan

Owner name	Tract #	Field name
Caledonia Prison Farm	3304-B	192

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
North Carolina\Halifax County	StB State fine sandy loam, 2 to 6 percent slopes\State fine sandy loam 80%	5.0	600	4.0

### Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation-induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US\$/ac
CMZ 67\A. Single Year/Single Crop Templates\Soybeans\Soybeans; spring disk, 45 BU, CMZ67		default	(none)	(none)	15	-1.1	86	0	4.79	664000	14.31
CMZ 67\A. Single Year/Single Crop Templates\Soybeans\Soybeans; strip till into winter weed residue, 45 BU, CMZ67		default	(none)	(none)	1.6	0.30	6.2	0	3.38	469000	10.11

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.



# COMPREHENSIVE NUTRIENT MANAGEMENT PLAN (CNMP) – North Carolina Certification Sheet

Animal Feeding Operation (AFO) Name:	Caledonia Prison Farm
Owner(s):	
Address:	P.O. Box 67, Tillery N.C. 27887
Farm/Tract Numbers	Tract 3302-A, 3304-B Farm 8920
County(ies)	Halifax

## OVERALL COMPREHENSIVE NUTRIENT MANAGEMENT PLAN APPROVAL

**Certified Conservation Planner (CCP):** As a CCP in North Carolina, I have reviewed your conservation plan prepared for the farms/tracts listed above, and determined that it meets the technical requirements for a USDA Comprehensive Nutrient Management Plan (CNMP). This Plan includes planned (or existing) practices for the following CNMP components: (1) Manure and Wastewater Handling and Storage, (2) Land Treatment, (3) Land Application of Manure or Organic Products, and (4) information on recommended Record Keeping. This CNMP may also include components that address Feed Management and Other Utilization Options. This CNMP contains all land units specific to this AFO that you own, operate, or have decision-making authority and on which manure or organic by-products will be generated, handled, stored, or applied.

Signature: <i>Terry L. Best</i>	Date: 4/12/12
Name (printed): Terry L. Best	
Title: DC Certified Conservation Planner	Agency/Org.: NRCS

## DESIGN OF CNMP COMPONENTS/PRACTICES

**CNMP Manure and Wastewater Storage and Handling:** All practices needed for the handling and storage of manure and wastewater either exist or have been designed according to NRCS standards.

Signature: <i>Will Mann</i>	Date: 4/12/12
Name (printed): Will Mann	
Title: Resource Conservation Specialist	Agency/Org.: Fishing Creek Soil and Water Conservation District

**Land Treatment:** All practices needed to maintain soil erosion to a sustainable level (on fields planned for manure application) either exist or have been designed according to NRCS standards.

Signature: <i>Will Mann</i>	Date: 4/12/12
Name (printed): Will Mann	
Title: Resource Conservation Specialist	Agency/Org.: Fishing Creek Soil and Water Conservation District

**CNMP Land Application:** The nutrient management/waste utilization plan has been developed according to NRCS standards 590, 633, and other applicable standards.

Signature: <i>Will Mann</i>	Date: 4/12/12
Name (printed): Will Mann	
Title: Resource Conservation Specialist	Agency/Org.: Fishing Creek Soil and Water Conservation District

# COMPREHENSIVE NUTRIENT MANAGEMENT PLAN (CNMP) – North Carolina

## Additional Information for Producers

### WHAT IS A USDA COMPREHENSIVE NUTRIENT MANAGEMENT PLAN (CNMP)?

Your CNMP is a USDA Conservation Plan that addresses the natural resource concerns associated with the management of manure and wastewater from livestock operation. Your CNMP addresses:

<b>Manure and Wastewater Storage and Handling</b>	Your CNMP ensures your operation has adequate collection, storage, and/or treatment of manure and organic by-products that allow land application of wastes in an environmentally sound manner. Manure handling and animal mortality disposal practices that are designed as part of your CNMP will meet applicable NRCS standards.
<b>Land Application of Manure and Wastewater</b>	Your CNMP includes a Nutrient Management/Waste Utilization Plan for all fields where manure or organic by-products are applied to ensure that nitrogen, phosphorus, and other potential pollutants do not cause a water quality problem. Your Nutrient Management Plan meets NRCS's standards 590 and 633 in the Field Office Technical Guide.
<b>Land Treatment for Application Areas</b>	Your CNMP includes erosion control practices on all land where manure or organic by-products are applied to ensure soil loss is kept to a sustainable level. Example practices include conservation tillage, cover crops, contour farming, diversions or terraces, or similar practices. All erosion control practices designed as part of your CNMP will meet NRCS standards in the Field Office Technical Guide.
<b>Record Keeping</b>	Although operation and maintenance records are your responsibility, your CNMP includes record-keeping recommendations associated with each practice in your CNMP. State laws and regulations identify specific record-keeping requirements for regulated or permitted operations.

Your CNMP may also address:

<b>Feed Management</b>	Feed management activities may be used to reduce the nutrient content of manure, reducing land application requirements. Examples include phase feeding, amino acid supplemented low crude protein diets, or the use of low phytin phosphorus grain and enzymes, such as phytase. You should always consult a professional animal nutritionist before making any changes, as feed management activities are not a viable or acceptable alternative for all operations.
<b>Other Utilization Options</b>	There are a number of alternative technologies to conventional manure management being evaluated in North Carolina and across the Nation as environmentally safe alternatives to land application of manure.

### NORTH CAROLINA LAWS AND REGULATIONS

USDA does not have a regulatory role for nutrient management. Although CNMPs are only required by USDA for animal operations participating in the Environmental Quality Incentives Program under the 2002 and 2008 Farm Bills, your CNMP may assist you in meeting federal or state water quality regulations or permit requirements. You should be aware of applicable laws and regulations in North Carolina that regulate the storage, handling, and land application of manure and organic by-products generated on your operation. For additional information on certified Waste Utilization Plans and applicable state laws and regulations, contact the North Carolina Department of Environment and Natural Resources, Division of Water Quality (919) 733-5083 or Division of Soil and Water Conservation (919) 733-2302.

# COMPREHENSIVE N RIENT MANAGEMENT PLAN (CI ?) – North Carolina Checklist

CNMP Developer Initials: WM

Animal Feeding Operation (AFO) Name:	<i>Caledonia Prison Farm</i>
Owner(s):	

The items identified in the Plan column must be included in the Conservation Plan to report a CNMP as written (Practice Code 102). The items in the Design column may be completed during the practice design for the specific CNMP components. Items identified in the Applied column must be completed to report a CNMP as applied (Practice Code 103). Per NRCS policy, CNMP documentation may also include a copy of the Certified Animal Waste Management Plan. Compliance with NC or EPA regulatory permitting or non-discharge certification options may require application of all planned and designed components. Referenced NC NRCS conservation practice standards that comprise the Field Office Technical Guide (FOTG) may be obtained at: <http://www.nrcs.usda.gov/technical/efotg/>

Plan	Design	Applied	Site information	Remarks/Location
<input checked="" type="checkbox"/>			Names, phone numbers, and addresses of the AFO owner(s) and operator(s).	
<input checked="" type="checkbox"/>			Location of production site: Legal description, driving instructions from nearest post office, and/or the emergency 911 coordinates.	
<input checked="" type="checkbox"/>			Conservation plan map, and farmstead sketch showing the general location of barns, pens, storage structures, etc. Clearly identified field identification numbers or codes.	
<input checked="" type="checkbox"/>			Soils maps with interpretations appropriate for planned CNMP practices. Available from NRCS field offices or NRCS Web Soil Survey for many areas. <a href="http://websoilsurvey.nrcs.usda.gov/app/">http://websoilsurvey.nrcs.usda.gov/app/</a>	
	<input checked="" type="checkbox"/>		Existing documentation of present facility components that would aid in evaluating existing conditions, capacities, etc. (i.e., as-built plans, year installed, number of animals a component was originally designed for, etc.).	
Plan	Design	Applied	Production Information	
<input checked="" type="checkbox"/>			Animal Inventory Sheet: Animal types, phases of production, and length of confinement for each type at this site	
<input checked="" type="checkbox"/>			Animal numbers and average weight for each phase of production on this site. Information available from NRCS 633 Waste Utilization Standard.	
<input checked="" type="checkbox"/>			Calculated manure and wastewater volumes for this site. Amount of manure and wastewater to be land applied. Information available from NRCS 633 Waste Utilization Standard.	
	<input type="checkbox"/>		Manure storage type, volume, and approximate length of storage.	
Plan	Design	Applied	Applicable Permits or Certifications	
<input checked="" type="checkbox"/>			Producer and operators informed of their responsibilities to comply with any applicable Federal, tribal, state, or local permits and/or ordinances, including operator certification, NPDES or other federal/state permits.	

# Checklist

CNMP Developer Initials : WM

Plan	Design	Applied	Land Application Site Information
<input checked="" type="checkbox"/>			Nutrient management (590)/waste utilization (633) plan prepared in accordance with applicable FOTG standards, including but not limited to:
<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> Maps of land application area (field identified consistent with plan map) showing land use and with marked setbacks, buffers, and waterways, and environmentally sensitive areas.
<input type="checkbox"/>			<input type="checkbox"/> Third-party applicator/manure hauler agreement with documentation of amount of waste transferred—NRCS 633 EXHIBIT B
<input type="checkbox"/>			<input type="checkbox"/> Landowner names, addresses, for land application fields not owned by producer.
<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> Phosphorus Loss Assessment Tool (PLAT) and/or all risk assessments for potential nitrogen or phosphorus transport from fields. PLAT software available for download at: <a href="http://www.soilnrcs.edu/nmp/nonmwd/">http://www.soilnrcs.edu/nmp/nonmwd/</a>
<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> Crop types, realistic yield targets, and expected nutrient uptake amounts.
<input type="checkbox"/>			<input type="checkbox"/> Application equipment descriptions and methods of application.
<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> Expected application seasons and estimated days of application per season.
<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> Estimated application amounts per acre (volume in gallons or tons per acre, and pounds of plant available nitrogen, phosphorus as P2O5, and potassium as K2O per acre).
<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> Estimate of acres needed to apply manure generated on this site, respecting any guidelines published for nitrogen or phosphorus soil loading limits.
<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> Lagoon Sludge Application Caution Page (if applicable).
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Application rates do not exceed limiting nutrient (N or P) specified in plan.
Plan	Design	Applied	Land Treatment Site Information
<input checked="" type="checkbox"/>		<input type="checkbox"/>	Practices exist, or are planned and applied, that achieve sustainable soil loss tolerance (based on soil type) on land application area (i.e., residue management, cropping rotation, diversions).
<input checked="" type="checkbox"/>			RUSLE Worksheet (Current Version). RUSLE 2 software available for download at: <a href="http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm">http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm</a>
<input type="checkbox"/>			NC-CPA-52 Environmental Assessment. Form and instructions available at <a href="http://www.nc.nrcs.usda.gov/technical/TechRef/CPForms.html">http://www.nc.nrcs.usda.gov/technical/TechRef/CPForms.html</a>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Practice designs/specifications for erosion control practices per applicable FOTG standards.
Plan	Design	Applied	Manure & Wastewater Storage and Handling
	<input checked="" type="checkbox"/>		Practice designs/specifications for manure and wastewater storage, treatment, and handling practices per applicable FOTG standards, including emergency action plans.
		<input checked="" type="checkbox"/>	Practices for proper storage and handling of manure and wastewater are implemented according to design or meet NRCS standards through as-built evaluation

	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	critically eroding areas around manure and wastewater storage structures stabilized to facilitate proper operation and maintenance of the structures.	
<b>Plan</b>	<b>Design</b>	<b>Applied</b>	<b>Actual Activity Records</b>	
<input checked="" type="checkbox"/>			Producer informed of record-keeping responsibilities according to 590 and 633 standards, and applicable state regulations on the storage, transport, transfer, testing, and application of manure. Including but not limited to:	
<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> <li>Soil and manure test reports.</li> </ul>	
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> <li>Applied rates, methods of application, and timing (month and year) of nutrients applied (include all sources of nutrients-manure, commercial fertilizers, etc.).</li> </ul>	
<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> <li>Current and/or planned crop rotation.</li> </ul>	
<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> <li>Weather conditions during nutrient application (optional).</li> </ul>	
<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> <li>General soil moisture condition at time of application [i.e., saturated, wet, moist, dry] (optional).</li> </ul>	
<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> <li>Actual crop and yield harvest from manure application sites if used in lieu of RYEs.</li> </ul>	
<input checked="" type="checkbox"/>		<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Record of internal inspections for manure system components.</li> </ul>	
<input checked="" type="checkbox"/>		<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Record of any spill events.</li> </ul>	IF NEEDED
<input type="checkbox"/>			<ul style="list-style-type: none"> <li>Changes or modifications to CNMP (may also require changes to applicable Permit)</li> </ul>	
<b>Plan</b>	<b>Design</b>	<b>Applied</b>	<b>Mortality Disposal</b>	
<input checked="" type="checkbox"/>			Practices planned for mortality disposal.	
	<input checked="" type="checkbox"/>		Design specifications and equipment used to implement the disposal plan.	
		<input checked="" type="checkbox"/>	Practices designed to properly dispose of operation mortality are implemented according to design	
<b>Plan</b>	<b>Design</b>	<b>Applied</b>	<b>Operation and Maintenance</b>	
	<input checked="" type="checkbox"/>		Detailed operation and maintenance procedures for the conservation system, holding facility, etc., contained in the CNMP. This would include procedures such as calibration of land application equipment, storage facility emptying schedule, soil and manure sampling techniques, etc.	
<input checked="" type="checkbox"/>			Client has been provided guidance on establishing and maintaining good vegetative cover on areas around constructed agricultural facilities (such as poultry houses). If necessary, client should utilize NC Technical Note for Erosion and Sediment Control Planning at Animal Feeding Operations found in Sec I of the NC NRCS Field Office Technical Guide.	

**ACKNOWLEDGMENT OF THE POTENTIAL IMPACTS ON A SITE  
FROM APPLYING LAGOON SLUDGE**

As part of either a lagoon closure operation or on-going lagoon maintenance, the attached plan has been developed to apply sludge to the following areas:

Tracts & Field Numbers: T 3302-A Field 36, 40, 41, 46, 47, 48  
T 3304-B Field 147, 164, 172, 189, 190, 192

While using animal waste as a source of nutrients for crops in lieu of inorganic fertilizers is an ecologically sound practice, producers should be aware that sludge that accumulates in a lagoon may have high concentrations of nutrients and/or heavy metals. Accordingly, the quantity of phosphorus and micronutrients in the material to be applied may exceed the fertility requirements of planned crops.

**Metals.** High concentrations of metals in the soil can impact crop growth or yields. The application of lagoon sludge has the potential to significantly increase the concentration of metals (particularly copper and zinc) in the soil. NCSU and NCDA&CS recommend that alternative sites for waste application be sought when soil concentrations of zinc (Zn) exceed 142 lbs/ac (Zn-I of 2000) or copper (Cu) exceed 72 lbs/ac (Cu-I of 2000). A Cu-I or Zn-I of 3000 is recognized as a critical toxic level for some crops. For peanuts, alternative sites are recommended when the Zn-I is 300, and a Zn-I of 500 is recognized as a critical toxic level. Producers should be aware of the post-application Cu and Zn concentrations predicted on the sites planned for sludge application. Additionally, soil pH should be maintained at 6.0 or above to minimize risk of toxicity.

**Phosphorus.** Phosphorus (P) concentration in lagoon sludge may be high. Because P adsorbs onto iron, aluminum, and calcium, the soil can bind and store excess P. When P concentrations reach higher concentrations, there is an increasing potential for P to be transported offsite and become a pollutant of surface waters. This transport may occur through soil erosion, or as a soluble form in surface runoff or leaching. An assessment of the risk for P loss to surface water is required as part of a nutrient management plan for permitted operations or those receiving federal or state cost-share assistance. If the potential for P transport offsite is high, then future application of animal waste may not be allowed in a nutrient management plan. Producers should be aware that applying lagoon sludge may limit the ability to use the site for future animal waste application. Accordingly, applying lagoon sludge to fields that are planned for future waste application as part of a nutrient management plan is not advised.

*I understand that applying macronutrients or micronutrients at rates that significantly exceed the expected crop removal could limit the future use of the field as a waste application site, and in some cases, negatively impact future plant growth. I voluntarily agree to apply sludge to the fields identified above that I own or operate according to the attached nutrient management plan or lagoon closure plan. (\*Both landowner and farmer/operator must sign.)*

Caledonia Pison / AC DDC  
Owner\*

4-12-12  
Date

Phillip C. Sykes  
Farmer/Operator\*

4-12-12  
Date



# EMERGENCY ACTION PLAN

## PHONE NUMBERS

DWQ  
EMERGENCY MANAGEMENT SYSTEM  
SWCD  
NRCS

919-791-4200  
252-583-2031  
252-583-3481 Ext #3  
252-583-3481 Ext #3

This plan will be implemented in the event that wastes from your operation are leaking, overflowing, or running off site. You should not wait until wastes reach surface waters or leave your property to consider that you have a problem. You should make every effort to ensure that this does not happen. This plan should be posted in an accessible location for all employees at the facility. The following are some action items you should take.

1. Stop the release of wastes. Depending on the situation, this may or may not be possible. Suggested responses to some possible problems are listed below.

A. Lagoon overflow-possible solutions are:

- a. Add soil to berm to increase elevation of dam.
- b. Pump wastes to fields at an acceptable rate.
- c. Stop all flows to the lagoon immediately.
- d. Call a pumping contractor.
- e. Make sure no surface water is entering lagoon.

B: Runoff from waste application field-actions include:

- a. Immediately stop waste application.
- b. Create a temporary diversion to contain waste.
- c. Incorporate waste to reduce runoff.
- d. Evaluate and eliminate the reason(s) that caused the runoff.
- e. Evaluate the application rates for the fields where runoff occurred.

C: Leakage from the waste pipes and sprinklers-action include:

- a. Stop recycle pump.
- b. Stop irrigation pump.
- c. Close valves to eliminate further discharge.
- d. Repair all leaks prior to restarting pumps.



D: Leakage from flush systems, houses, solid separators-action include:

- a. Stop recycle pump.
- b. Stop irrigation pump.
- c. Make sure no siphon occurs.
- d. Stop all flows in the house, flush systems, or solid separators.
- e. Repair all leaks prior to restarting pumps.

E: Leakage from base or sidewall of lagoon. Often this is seepage as opposed to flowing leaks- possible action:

- a. Dig a small sump or ditch away from the embankment to catch all seepage, put in a submersible pump, and pump back to lagoon.
- b. If holes are caused by burrowing animals, trap or remove animals and fill holes and compact with a clay type soil.
- c. Have a professional evaluate the condition of the side walls and lagoon bottom as soon as possible.

2. Assess the extent of the spill and note any obvious damages.

- a. Did the waste reach any surface waters?
- b. Approximately how much was released and for what duration?
- c. Any damage noted, such as employee injury, fish kills, or property damage?
- d. Did the spill leave the property?
- e. Does the spill have the potential to reach surface waters?
- f. Could a future rain event cause the spill to reach surface waters?
- g. Are potable water wells in danger (either on or off of the property)?
- h. How much reached surface waters?

3: Contact appropriate agencies.

- a. During normal business hours, call your DWQ (Division of Water Quality) regional office; Phone - - -. After hours, emergency number: 919-733-3942. Your phone call should include: your name, facility, telephone number, the details of the incident from item 2 above, the exact location of the facility, the location or direction of movement of the spill, weather and wind conditions. The corrective measures that have been under taken, and the seriousness of the situation.
- b. If spill leaves property or enters surface waters, call local EMS Phone number - - -.
- c. Instruct EMS to contact local Health Department.
- d. Contact CES, phone number - - -, local SWCD office phone number - - -, and local NRCS office for advice/technical assistance phone number - - -.

- 4: If none of the above works call 911 or the Sheriff's Department and explain your problem to them and ask that person to contact the proper agencies for you.
- 5: Contact the contractor of your choice to begin repair of problem to minimize off-site damage.
- a. Contractors Name: \_\_\_\_\_
- b. Contractors Address: \_\_\_\_\_
- c. Contractors Phone: \_\_\_\_\_
- 6: Contact the technical specialist who certified the lagoon (NRCS, Consulting Engineer, etc.)
- a. Name: Terry Best NRCS
- b. Phone: 252-583-3481 Ext #3
- 7: Implement procedures as advised by DWQ and technical assistance agencies to rectify the damage, repair the system, and reassess the waste management plan to keep problems with release of wastes from happening again.

# Insect Control Checklist for Animal Operations

Source	Cause	BMP's to Control Insects	Site Specific Practices
Flush Gutters	• Accumulation of solids	<input checked="" type="checkbox"/> Liquid Systems <input checked="" type="checkbox"/> Flush system is designed and operated sufficiently to remove accumulated solids from gutters as designed. <input type="checkbox"/> Remove bridging of accumulated solids at discharge	
Lagoons and Pits	• Crusted Solids	<input checked="" type="checkbox"/> Maintain lagoons, settling basins and pits where pest breeding is apparent to minimize the crusting of solids to a depth of no more than 6 - 8 inches over more than 30% of surface. <input checked="" type="checkbox"/> Maintain vegetative control along banks of lagoons and other impoundments to prevent accumulation of decaying vegetative matter along water's edge on impoundment's perimeter.	
Excessive Vegetative Growth	• Decaying vegetation	<input checked="" type="checkbox"/> Maintain vegetative control along banks of lagoons and other impoundments to prevent accumulation of decaying vegetative matter along water's edge on impoundment's perimeter.	
Feeders	• Feed Spillage	<input checked="" type="checkbox"/> Dry Systems <input checked="" type="checkbox"/> Design, operate and maintain feed systems (e.g., bunkers and troughs) to minimize the accumulation of decaying wastage. <input checked="" type="checkbox"/> Clean up spillage on a routine basis (e.g., 7 - 10 day interval during summer; 15-30 day interval during winter).	
Feed Storage	• Accumulations of feed residues	<input checked="" type="checkbox"/> Reduce moisture accumulation within and around immediate perimeter of feed storage areas by insuring drainage away from site and/or providing adequate containment (e.g., covered bin for brewer's grain and similar high moisture grain products). <input checked="" type="checkbox"/> Inspect for and remove or break up accumulated solids in filter strips around feed storage as needed.	

Source	Cause	BMPs to Control Insects	Site Specific Practices
Animal Holding Areas	<ul style="list-style-type: none"> <li>Accumulations of animal wastes and feed wastage</li> </ul>	<input type="checkbox"/> Eliminate low areas that trap moisture along fences and other locations where waste accumulates and disturbance by animals is minimal. <input type="checkbox"/> Maintain fence rows and filter strips around animal holding areas to minimize accumulations of wastes (i.e., inspect for and remove or break up accumulated solids as needed).	
Dry Manure Handling Systems	<ul style="list-style-type: none"> <li>Accumulations of animal wastes</li> </ul>	<input type="checkbox"/> Remove spillage on a routine basis (e.g., 7 - 10 day interval during summer; 15-30 day interval during winter) where manure is loaded for land application or disposal. <input type="checkbox"/> Provide for adequate drainage around manure stockpiles. <input type="checkbox"/> Inspect for and remove or break up accumulated wastes in filter strips around stockpiles and manure handling areas as needed.	

For more information contact the Cooperative Extension Service, Department of Entomology, Box 7613, North Carolina State University, Raleigh, NC, 27695-7613.

## Poultry Farm Waste Management Odor Control Checklist

Source	Cause	BMPs to Minimize Odor	Site Specific Practices
Farmstead	<ul style="list-style-type: none"> <li>Poultry production</li> </ul>	<input type="checkbox"/> Vegetative or wooded buffers <input checked="" type="checkbox"/> Recommended best management practices <input checked="" type="checkbox"/> Good judgment and common sense	
Floor surfaces (walk aisles)	<ul style="list-style-type: none"> <li>Wet dirty surfaces</li> </ul>	<input type="checkbox"/> Scrape manure, dust, feathers into collection alleys <input type="checkbox"/> Splash boards along upper ends of collection alleys <input checked="" type="checkbox"/> Proper ventilation	
Cage manure dropping boards	<ul style="list-style-type: none"> <li>Manure-covered surfaces</li> </ul>	<input type="checkbox"/> Scrape manure into collection alleys	
Manure collection alleys	<ul style="list-style-type: none"> <li>Partial microbial decomposition</li> </ul>	<input checked="" type="checkbox"/> Frequent manure removal by flush or scrape <input checked="" type="checkbox"/> Frequent checks and maintenance on waterers and water pipes	
Ventilation exhaust fans	<ul style="list-style-type: none"> <li>Volatile gases</li> <li>Dust</li> </ul>	<input type="checkbox"/> Fan maintenance <input checked="" type="checkbox"/> Efficient air movement	
Indoor surfaces	<ul style="list-style-type: none"> <li>Dust</li> </ul>	<input type="checkbox"/> Vacuum or washdown between flocks	
Manure conveyors	<ul style="list-style-type: none"> <li>Partial microbial decomposition</li> </ul>	<input type="checkbox"/> Keep mechanical equipment in good repair <input type="checkbox"/> Remove manure accumulations promptly	
Storage tank or basin surface	<ul style="list-style-type: none"> <li>Partial microbial decomposition</li> <li>Mixing while filling</li> <li>Agitation when emptying</li> </ul>	<input type="checkbox"/> Bottom or midlevel loading <input type="checkbox"/> Tank covers <input type="checkbox"/> Basin surface mats of solids <input type="checkbox"/> Proven biological additives or oxidants	
Manure slurry or sludge spreader outlets	<ul style="list-style-type: none"> <li>Agitation when spreading</li> <li>Volatile gas emissions</li> </ul>	<input type="checkbox"/> Soil injection of slurry/sludges <input type="checkbox"/> Wash residual manure from spreader after use <input type="checkbox"/> Proven biological additives or oxidants	

## Poultry Farm Waste Management Odor Control Checklist

Source	Cause	BMPs to Minimize Odor	Site Specific Practices
Uncovered manure slurry or sludge on field surfaces	<ul style="list-style-type: none"> <li>• Volatile gas emissions while drying</li> </ul>	<input type="checkbox"/> Soil injection of slurry/sludges <input type="checkbox"/> Soil incorporation within 48 hours	
Outside drain collection or junction boxes	<ul style="list-style-type: none"> <li>• Agitation during wastewater conveyance</li> </ul>	<input type="checkbox"/> Box covers	
Lift stations	<ul style="list-style-type: none"> <li>• Agitation during sump tank filling and drawdown</li> </ul>	<input type="checkbox"/> Sump tank covers	
End of drainpipes at lagoon	<ul style="list-style-type: none"> <li>• Agitation during wastewater conveyance</li> </ul>	<input type="checkbox"/> Extend discharge point of pipes underneath lagoon liquid level	
Lagoon surfaces	<ul style="list-style-type: none"> <li>• Volatile gas emissions</li> <li>• Biological mixing</li> <li>• Agitation</li> </ul>	<input checked="" type="checkbox"/> Proper lagoon liquid capacity <input type="checkbox"/> Correct lagoon startup procedures <input type="checkbox"/> Minimum surface area-to-volume ratio <input type="checkbox"/> Minimum agitation while pumping <input checked="" type="checkbox"/> Mechanical aeration <input type="checkbox"/> Proven biological additives	
Irrigation sprinkler nozzles	<ul style="list-style-type: none"> <li>• High pressure agitation</li> <li>• Wind drift</li> </ul>	<input checked="" type="checkbox"/> Irrigate on dry days with little or no wind <input checked="" type="checkbox"/> Minimum recommended operating procedure <input type="checkbox"/> Pump intake near lagoon liquid surface <input checked="" type="checkbox"/> Pump from second-stage lagoon	

## Poultry Farm Waste Management Odor Control Checklist

Source	Cause	BMPs to Minimize Odor	Site Specific Practices
Dead birds	<ul style="list-style-type: none"> <li>• Carcass decomposition</li> </ul>	<input checked="" type="checkbox"/> Proper disposition of carcasses	
Dead bird disposal pits	<ul style="list-style-type: none"> <li>• Carcass decomposition</li> </ul>	<input type="checkbox"/> Complete covering of carcasses in burial pits <input type="checkbox"/> Proper location/construction of disposal pits <input type="checkbox"/> Disposal pit covers tight fitting	
Standing water around facilities	<ul style="list-style-type: none"> <li>• Improper drainage</li> <li>• Microbial decomposition of organic matter</li> </ul>	<input checked="" type="checkbox"/> Grade and landscape such that water drains away from facilities	
Mud tracked onto public roads from farm access	<ul style="list-style-type: none"> <li>• Poorly maintained access roads</li> </ul>	<input checked="" type="checkbox"/> Farm access road maintenance	

### Additional Information:

Poultry Manure Management; .0200 Rule/BMP Packet

Poultry Layer Production Facility Manure Management: High Rise, Deep Pit; EBAE 131-88

Poultry Layer Production Facility Manure Management: Undercage Flush—Lagoon Treatment; EBAE 130-88

Lagoon Design and Management for Livestock Manure Treatment and Storage; EBAE 103-83

Calibration of Manure and Wastewater Application Equipment; EBAE Fact Sheet

Proper Disposal of Dead Poultry; PS&T Guide No. 19

Nuisance Concerns in Animal Manure Management: Odors and Flies; PRO107, 1995 Conference Proceedings

### Available From:

NCSU, County Extension Center

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Florida Cooperative Extension

**Mortality Management Methods**  
(check which method(s) are being implemented)

- ☐ Burial three feet beneath the surface of the ground within 24 hours after knowledge of the death. The burial must be at least 300 feet from any flowing stream or public body of water.
- ☐ Rendering at a rendering plant licensed under G.S. 106-168.7
- ☒ Complete incineration
- ☐ In the case of dead poultry only, placing in a disposal pit of a size and design approved by the Department of Agriculture
- ☐ Any method which in the professional opinion of the State Veterinarian would make possible the salvage of part of a dead animal's value without endangering human or animal health. (Written approval of the State Veterinarian must be attached)